

What is claimed is:

1. An optical transmission system comprising:
  - a primary path disposed between a first end and a second end, said primary path configured to transmit optical signals between said first end and said second end;
  - a secondary path disposed between said first end and said second end, said secondary path configured to transmit optical signals between said first end and said second end; and
  - a first variable ratio coupler coupled to said primary path and said secondary path between said first end and said second end, said first variable ratio coupler configured to adjust a coupling ratio between said primary path and said secondary path.
2. The optical transmission system of claim 1 wherein said first variable ratio coupler comprises a primary detector coupled to said primary path and a secondary detector coupled to said secondary path.
3. The optical transmission system of claim 2 wherein said primary detector is configured to detect optical signals transmitted along said primary path and said secondary detector is configured to detect optical signals transmitted along said secondary path.
4. The optical transmission system of claim 1 wherein said primary path is configured to transmit optical signals in a normal condition and said secondary path is configured to transmit optical signals in an off-normal condition.
5. The optical transmission system of claim 1 wherein said first variable ratio coupler is configured to detect optical signals on said primary path and said secondary path and adjust said coupling ratio between said primary path and said secondary path responsive to a break in said primary path.

6. The optical transmission system of claim 5 wherein said coupling ratio between said primary path and said secondary path is adjusted to about 100% for said secondary path and about 0% for said primary path in response to said break.

7. The optical transmission system of claim 1 wherein said first variable ratio coupler is configured to detect optical signals on said primary path and said secondary path and adjust said coupling ratio between said primary path and said secondary path responsive to a repair of said primary path.

8. The optical transmission system of claim 1 wherein said first variable ratio coupler is configured to adjust said coupling ratio from about 0% to about 100%.

9. The optical transmission system of claim 1 further comprising:  
a paths down alarm configured to indicate a complete loss of system transmission responsive to both the primary detector and the secondary detector detecting a loss of signal.

10. The optical transmission system of claim 1 further comprising:  
an optical switch coupled to said primary path and said secondary path opposite said first variable ratio coupler between said first end and said second end, said optical switch configured to switch between said primary path and said secondary path responsive to the presence of optical signals.

11. The optical transmission system of claim 10 wherein said optical switch comprises:

a switch element in operative communication with both said primary path and said secondary path,

a primary switch detector coupled to said primary path, and

a secondary switch detector coupled to said secondary path.

12. The optical transmission system of claim 1 wherein a link is defined between said first end and said second end, said first variable ratio coupler being configured to adjust said coupling ratio in response to a loss budget of said link.

13. The optical transmission system of claim 1 further comprising:  
a second variable ratio coupler coupled to said primary path and said secondary path between said first end and said second end opposite said first variable ratio coupler.

14. The optical transmission system of claim 13 wherein said second variable ratio coupler is configured to adjust said coupling ratio between said primary path and said secondary path.

15. The optical transmission system of claim 13 wherein said second variable ratio coupler comprises:

a second primary detector coupled to said primary path and a second secondary detector coupled to said secondary path, and

a primary switch element coupled to said primary path and a secondary switch element coupled to said secondary path.

16. The optical transmission system of claim 15 wherein said primary switch element and said secondary switch element are configured to couple and decouple said primary path and said secondary path.

17. The optical transmission system of claim 13 wherein said first variable ratio coupler and said second variable ratio coupler are configured to adjust said coupling ratio between said primary path and said secondary path.

18. The optical transmission system of claim 13 wherein said first variable ratio coupler and said second variable ratio coupler are configured to adjust said coupling

ratio between said primary path and said secondary path responsive to one of a primary path break and a primary path recovery.

19. The optical transmission system of claim 13 wherein said primary switch element and said secondary switch element are configured to prevent simultaneous operation of said primary path and said secondary path.

20. The optical transmission system of claim 13 wherein said first variable ratio coupler and said second variable ratio coupler are adjustable and configured to readjust passing 100% through said primary path responsive to a recovery of said primary path.